II. "Preliminary Note on the Action of Calcium, Barium, and Potassium on Muscle." By T. Lauder Brunton, M.D., F.R.S., and Theodore Cash, M.D. Received February 13, 1883.

It has been shown by Ringer that calcium prolongs the contraction of the frog's heart. This prolongation is diminished by the subsequent addition of potash.

It occurred to us that calcium and potassium salts might exercise a similar action on voluntary muscle. On trying it, we found this to be the case. Calcium in dilute solution prolongs the duration of the contraction in the gastrocnemius of the frog. Potassium salts subsequently applied shorten the contraction. We have been led to try the effect of barium on muscle by considerations regarding the relations of groups of elements, according to Mendelejeff's classification, to their physiological action. These considerations we purpose to develop in another paper. The effect of barium is very remarkable. It produces a curve very much like that caused by veratria, both in its form and in the modifications produced in it by repeated stimuli. We have found that the veratria curve is restored by potash to the normal in the case of the gastrocnemius, just as Ringer found it in the case of the frog's heart. The peculiarity which barium produces in the gastrocnemius is also abolished by potash. We have tested a number of other substances belonging to allied groups, and find that some of them have a similar, though not identical, action with barium. The results of these experiments, as well as the general considerations to which we have already alluded, we purpose to discuss in another paper.

III. "On the Formation of Uric Acid in the Animal Economy and its relation to Hippuric Acid." By Alfred Baring Garrod, M.D., F.R.S. Received February 15, 1883.

(Abstract.)

The results which have been arrived at, and discussed in this communication, may be summed up as follows:—

Introduction.—The solubility of uric acid and of some of its more important salts at the temperature of the healthy human body has been determined and arranged in a tabular form. These figures may be useful for future reference.

The action of urates of ammonium and sodium upon chlorides and phosphates of the same bases, when mixed with each other in different proportions, has been ascertained.